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FOREST PEST MANAGEMENT
Pacific Southwest Region

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EVALUATION OF PEST CONDITIONS IN FOUR CAMPGROUNDS, BIG VALLEY RANGER DISTRICT, MODOC NATIONAL FOREST

Dave Schultz, Entomologist
James Allison, Plant Pathologist

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ABSTRACT

Pest conditions were evaluated in Lower Rush Creek, Upper Rush Creek, Ash Creek and Willow Creek campgrounds. Each of the campgrounds has situations which can influence tree mortality or growth. Conditions discussed include inadequate drainage, overstocking, dwarf mistletoe, pocket gophers and western pine shoot borer.

INTRODUCTION

The Modoc National Forest requested evaluations of pest conditions in major recreational areas as input to vegetation management plans. Lower Rush Creek, Upper Rush Creek, Ash Creek and Willow Creek Campgrounds on the Big Valley Ranger District were evaluated on August 18, 1983.

LOWER RUSH CREEK - OBSERVATIONS AND DISCUSSION

Lower Rush Creek Campground is bisected by Rush Creek. The east side of the campground contains 5 campsites with parking spurs. The vegetation in the east side consists largely of juniper with scattered ponderosa pine. The only pest problems noted on this side were pocket gophers, Thomomys spp, which may be responsible for maintaining a fairly large open area at the south end, and scattered western dwarf mistletoe, Arceuthobium campylopodum, in ponderosa pine.

The vegetation along Rush Creek consists of cottonwoods of all sizes and some shrubby willows. Some of the larger size cottonwoods are showing signs of dieback including dead tops, bole cracks and wetwood. Frost

can cause both dieback and bole cracks. Bole cracks can allow the entry of decay organisms. Some of the larger cottonwoods have the potential to become hazardous.

The creek has been channelized and the banks reinforced through most of the campground. There is an overflow area on the north end of the campground at the border with private land. Saturated soil has contributed to mortality of ponderosa pine and incense-cedar in this area. There are relatively few trees still alive in the areas affected by saturated soil. It might facilitate re-establishment of trees in the area if the flooding could be solved, but any alteration of the creek channel could create legal liabilities for downstream damages.

There are 5 walk-in campsites in the west half of the campground. The vegetation is primarily ponderosa pine. The major pest problem is dwarf mistletoe in the ponderosa pine.

Most of the dwarf mistletoe-infected trees in the campground have ratings of 3 or 4 on the Hawksworth rating system. This level of infection is considered to have a moderate effect on the host. This also indicates that the dwarf mistletoe is generally confined to the lower two-thirds of the crown. The lifespan of some infected trees could be extended if the large witches' brooms in the lower crowns were pruned out. Pruning would not eliminate dwarf mistletoe, however, and at some point the infected trees would have to be removed to successfully regenerate replacements.

MANAGEMENT ALTERNATIVES

1. Do Nothing. Pine which have dwarf mistletoe ratings of 5 or 6 have a higher than average probability of dying within the next 10 to 15 years. Dwarf mistletoe will intensify with time in both individual trees and in the campground. Healthy replacement trees will be difficult to bring along in the campground as long as the overstory is infected with dwarf mistletoe. Gophers may prevent the establishment of reproduction in some areas. Periodic flooding on the north end of the campground may cause some mortality.

2. Alter drainage. Altering the drainage on the north end of the campground might prevent the loss of a few more trees and would allow the area to be reforested but, it would also create certain legal liabilities. Consultation with the adjacent landowner and the Soil Conservation Service prior to any construction would seem warranted.

3. Control gophers. Gopher control would improve the chance of success of replanting the southeast quarter of the campground. Control efforts would not accomplish anything if there are no immediate plans for revegetating the area. Replanting the southeast corner is likely to be futile unless efforts are also undertaken to control the dwarf mistletoe surrounding it.

4. Control dwarf mistletoe. Pruning the large heavy brooms from the lower crowns of an infected tree will increase the vigor of the tree if at least 30 percent live crown will remain. Broom pruning will not affect the spread of dwarf mistletoe because there are usually infections above the brooms. Infected overstory trees would have to be removed within a few years after the establishment of an understory if uninfected replacement trees are desired. If treatment is undertaken to eliminate dwarf mistletoe, it would be appropriate to extend the treatment about one tree height beyond the campground boundary to exclude new infections.

UPPER RUSH CREEK - OBSERVATIONS AND DISCUSSION

Upper Rush Creek campground has 13 units. The forest cover consists of Jeffrey pine, white fir, and incense-cedar which range in size from small poles to overmature sawtimber. Stocking is generally very heavy and approaches 500 sq. ft. BA in places. There are numerous trees with forked tops or doglegs. The grain of the wood in these trees is not as strong as that in a straight bole. These trees may become hazardous as the size, and therefore the weight of the tops increase.

The only active pest situation noted in the campground involved seepage from the hillside where the spring box is located. The soil was saturated in a drainage extending from the hillside to Rush Creek. The saturated soil has stressed trees and allowed armillaria root rot caused by Armillariella mellea to kill some Jeffrey pine and incense-cedar over a period of many years. There may be some value in attempting to engineer a solution to the drainage problem because there are still some living trees in the affected area.

MANAGEMENT ALTERNATIVES

1. Do Nothing. It is unlikely that the current high basal areas can be maintained indefinitely. At some future point there will be additional stress such as drought. Drought is likely to trigger mortality, which, in turn, has the potential to change the character of the campground. Mortality will occur on a fairly continuous basis in the saturated area as long as live trees remain. The saturated area may become quite open at some point if tree seedlings are also unable to survive. Some of the larger trees with forked tops or doglegs have potential to cause considerable damage if they fail; however, failures would probably be the result of heavy snow loads during the winter when the campground is unoccupied.

2. Alter drainage. If the seepage could be stopped or channelized, it would probably prevent the death of a few trees near the edge of the campground. It would also make the affected area more conducive to recreational use. If very many tree roots were injured by construction to alter the drainage, however, the result could be as much or more mortality than doing nothing.

3. Thin campground. Thinning the campground should increase tree vigor and make it more resistant to bark beetle attack. It would also offer an opportunity to remove some trees which are more of a liability than an asset such as suppressed or deformed trees and those with broken tops. Thinning would not reduce the amount of screening very much because little of the current foliage is close enough to the ground to block the line of sight between campsites. Because the soil is of volcanic origin and there is juniper at the edge of the campground, it may be appropriate to use guidelines for the eastside pine type to select residual basal areas.

ASH CREEK - OBSERVATIONS AND DISCUSSION

Ash Creek campground has six units and is located on a low ridge east of a meadow bordering Ash Creek. There is a sparse covering of Jeffrey and ponderosa pine. Several of the trees in or near the campground are overmature. There are a few shrubs in the campground such as Klamath plum, although they are not large enough or numerous enough to provide much screening.

The only pest observed in the campground was western dwarf mistletoe, Arceuthobium campylopodum. The infected trees had dwarf mistletoe ratings of 3 to 4 on the Hawksworth system. Because the campground is on a fairly harsh site, a moderate dwarf mistletoe infection could have a substantial effect on the vigor of infected trees. The vigor of the infected trees would be improved if the mistletoe brooms were pruned out, and also if a few saplings were thinned out of infected clumps. This would improve their resistance to bark beetles and thereby extend their lifespan. If a program to reduce the impact of dwarf mistletoe in the campground is undertaken, it would be important to consider the infected trees adjacent to the campground. One or more of the large trees south of the campground are so severely infected that they could not be successfully pruned. The source of dwarf mistletoe seed could be eliminated by harvesting the trees or by dropping them in place or by girdling and leaving the trees for wildlife purposes.

MANAGEMENT ALTERNATIVES

1. Do Nothing. Dwarf mistletoe will slowly intensify in the infected trees in the campground and may spread to some trees which are currently uninfected. It may take a decade or two before some trees are weakened enough to be highly susceptible to bark beetles, but by that point some control options will be foregone. One or more of the overmature pines may succumb to the rigors of normal campground use, whether it is infected with dwarf mistletoe or not. Because natural regeneration is generally lacking, some portions of the campground could eventually become rather open.

2. Plant replacement trees. Several of the prominent trees in the campground are at or past maturity and they appear to be of low to moderate vigor. Their condition should be expected to decline with time and continued campground use. There may be a limited opportunity to

culture replacement trees prior to the removal of the existing trees. Attempting to regenerate trees in the campground without any form of dwarf mistletoe control is likely to be counterproductive.

3. Control dwarf mistletoe. Control of dwarf mistletoe would increase the chances of maintaining or improving the character of the campground over an extended period of time. A complete treatment would involve pruning as many as 10 trees, removing a few large saplings or small poles and felling or girdling one or two trees adjacent to the campground.

WILLOW CREEK CAMPGROUND AND PICNIC AREA - OBSERVATIONS AND DISCUSSION

Willow Creek campground and picnic area are located adjacent to Willow Creek and State highway 139. The creekside vegetation is mostly willow shrubs and aspen saplings. Most of the campground trees are 6-10 ft. tall planted ponderosa pine. Quite a few of these saplings have been infested by the western pine shoot borer, Eucosma sonomana. When the larvae of this moth bore in a shoot, it generally results in reduced growth of a leader or the death of a lateral. It has been reported that reduced terminal growth caused by this insect has resulted in 25 percent growth loss in young plantations during short time spans, although the cummulative growth loss over long periods of time is probably less. Synthetically produced western pine shoot borer pheromone is registered (EPA reg. 8730-20) to protect pines from infestation by disrupting adult mating. The pheromone is incorporated in small plastic flakes covered with a sticker and is usually aerially applied. Trees would have to be treated each spring to maintain protection until they reach about 30 feet high. Some protected trees would probably be removed during future thinnings.

A few old-growth ponderosa pine remain in the campground. One of these trees in the loop by sites 3, 4 and 5 has low needle retention which indicates low vigor. It is likely that the asphalt loop around the tree and the toilet facilities near its base are partially responsible for its condition. There is also a rather substantial amount of woody and herbaceous vegetation around the tree, considering its location and condition. If most of the other vegetation was removed from the loop, the condition of this tree should improve or at least stabilize, which should extend its lifespan. If there are no plans to retain the old-growth pine as a specimen or character tree, however, the long-term vegetation management plan might consider removing it to release or make room for a younger replacement.

Tree cover in the picnic area is almost entirely ponderosa pine. The trees are generally pole to sawtimber size and 80 to 100 years old except several pre-dominants which are much older. The site class is 100 Meyer. Basal areas range from 360 to 400 square feet. Based on the age of the younger trees which comprise the majority of the campground aggregations, normal stocking would be 228 sq.ft. Stands which have greater than normal stocking have a higher probability of coming under

attack by bark beetles than stands stocked below normal levels. Bark beetle attacks in stands which are almost entirely pine, such as the picnic area, often lead to group kills. The risk of bark beetle attacks which could alter the character of the picnic area could be reduced by thinning the area. Although the Silvicultural Practices Handbook lists 165-175 sq.ft. BA as desired stocking levels for Site 100 at 80-100 years of age, these targets may be too low for a first entry in the picnic area. A higher residual basal area is probably appropriate because at age 80-100, much of the expected height growth of the stand has already occurred and crowns and roots are not being produced as fast as a younger stand. Also, the stand is so overstocked at this point that cutting it back to published "desired" levels would remove 50-60 percent of the basal area which could drastically open up the stand. An initial entry that adjusted the stocking toward normal should substantially increase tree resistance to bark beetle attack without total alteration of the appearance of the picnic area.

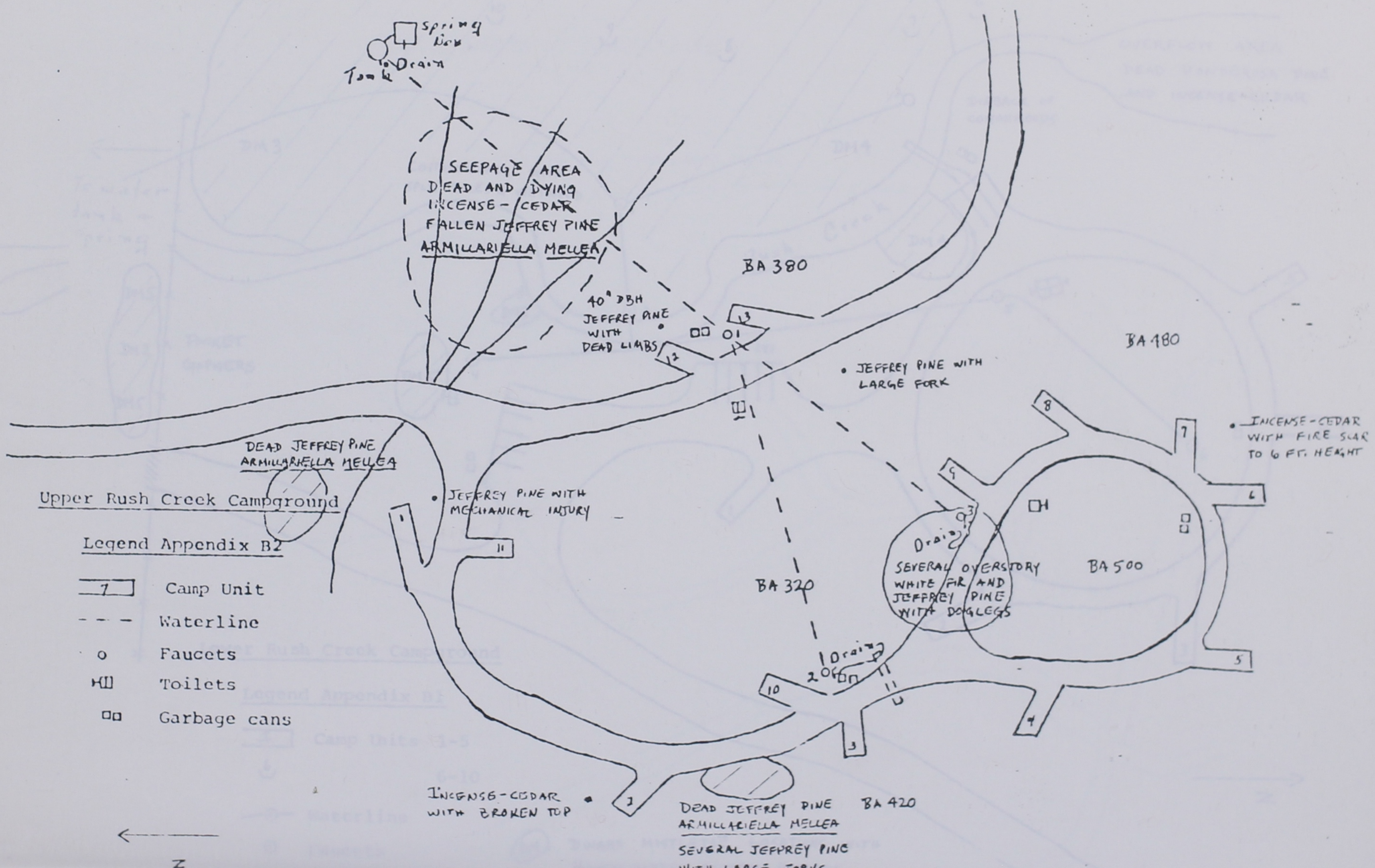
MANAGEMENT ALTERNATIVES

1. Do Nothing. The basal area of the picnic area will increase with time, which will adversely affect tree and stand vigor. If vigor becomes low enough or if additional stress such as drought is added, bark beetles will successfully attack some of the trees. The high density of pine may lead to group mortality. Planted pine in the campground will experience leader growth loss due to western pine shoot borer, but growth loss due to intertree competition will be even greater within a decade. Residual old-growth campground trees will continue to decline, although some will survive for decades.

2. Control western pine shoot borer. Application of synthetic pheromone to planted campground trees during spring should reduce infestation rates of terminals and laterals by at least 70-80 percent for the season. Control of western pine shoot borer should not affect survival of the planted trees, but would increase terminal growth and decrease lateral flagging on some. The pheromone is considered a pesticide (EPA Reg. 8730-20) and normal administrative procedures relative to the use of pesticides would be applicable. Previous control efforts have used aerial application techniques to distribute the pheromone impregnated plastic flakes and sticker combination over the tree crowns. Some trees receiving annual protective applications would probably be removed during thinning.

3. Thin and control vegetation. Thinning the picnic area should decrease stress and decrease the chances of mortality due to bark beetles. Because the current stocking is so high and the stand is relatively old, a series of light thinnings is more likely to produce desired results than one heavy thinning. Thinning or vegetation control around remnant old-growth trees in the campground may extend their useful lifespan. Prior to thinning around old-growth trees, however, it might be prudent to consider that even under the best of conditions, some of them may not survive for extended periods of time and that

younger replacement trees might be a more profitable long-term investment. Thinning and vegetation control around the planted trees in the campground would probably accentuate the differences in terminal growth due to the western pine shoot borer, but would reduce the length of time until the trees reached a height of 30 feet and were no longer susceptible.


Spring Box
Drain
Tank
SEEPAGE AREA
DEAD AND DYING
INCENSE - CEDAR
FALLEN JEFFREY PINE
ARMILLARIELLA MELLEA
BA 380
40" DBH
JEFFREY PINE
WITH
DEAD LIMBS
13
12
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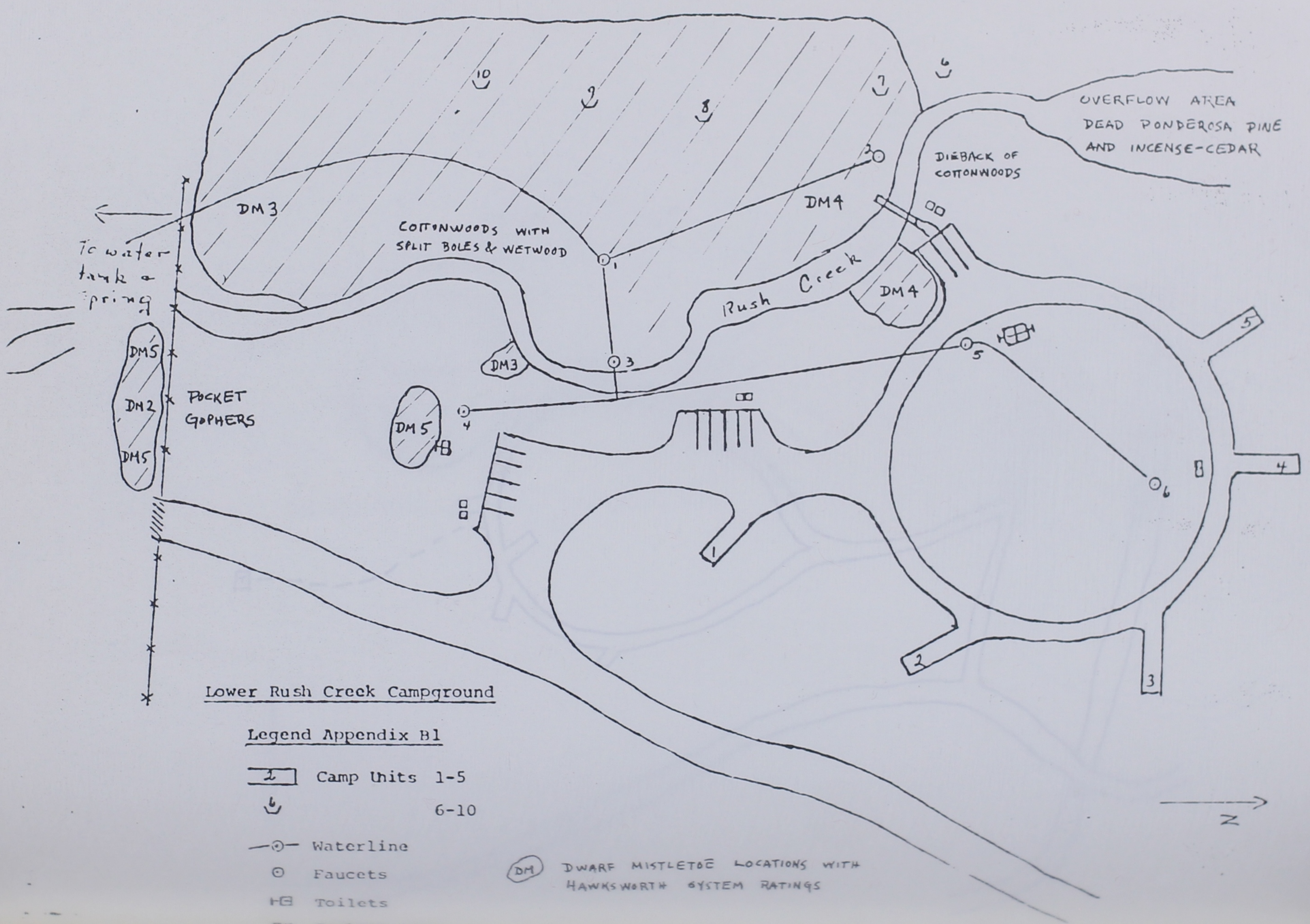
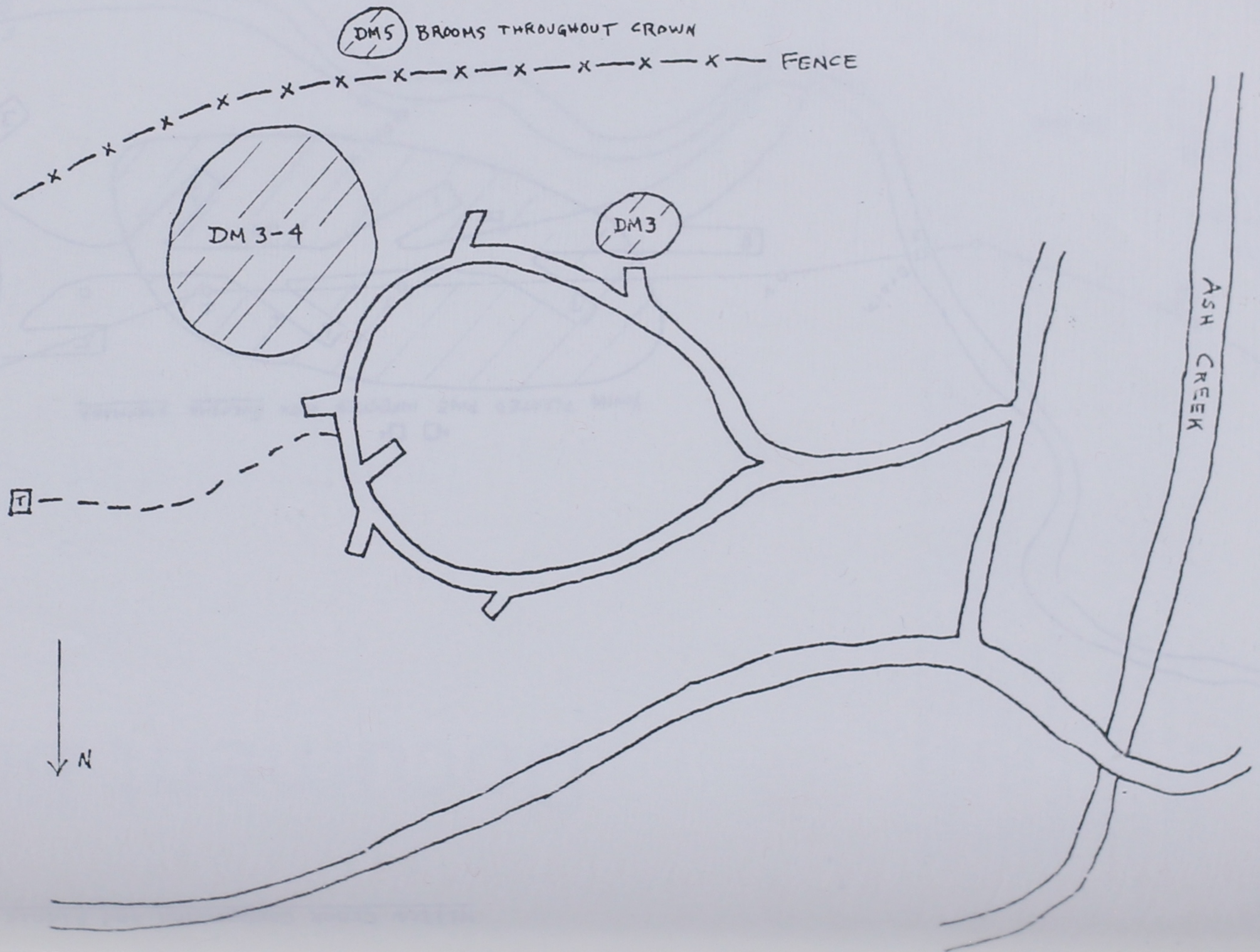
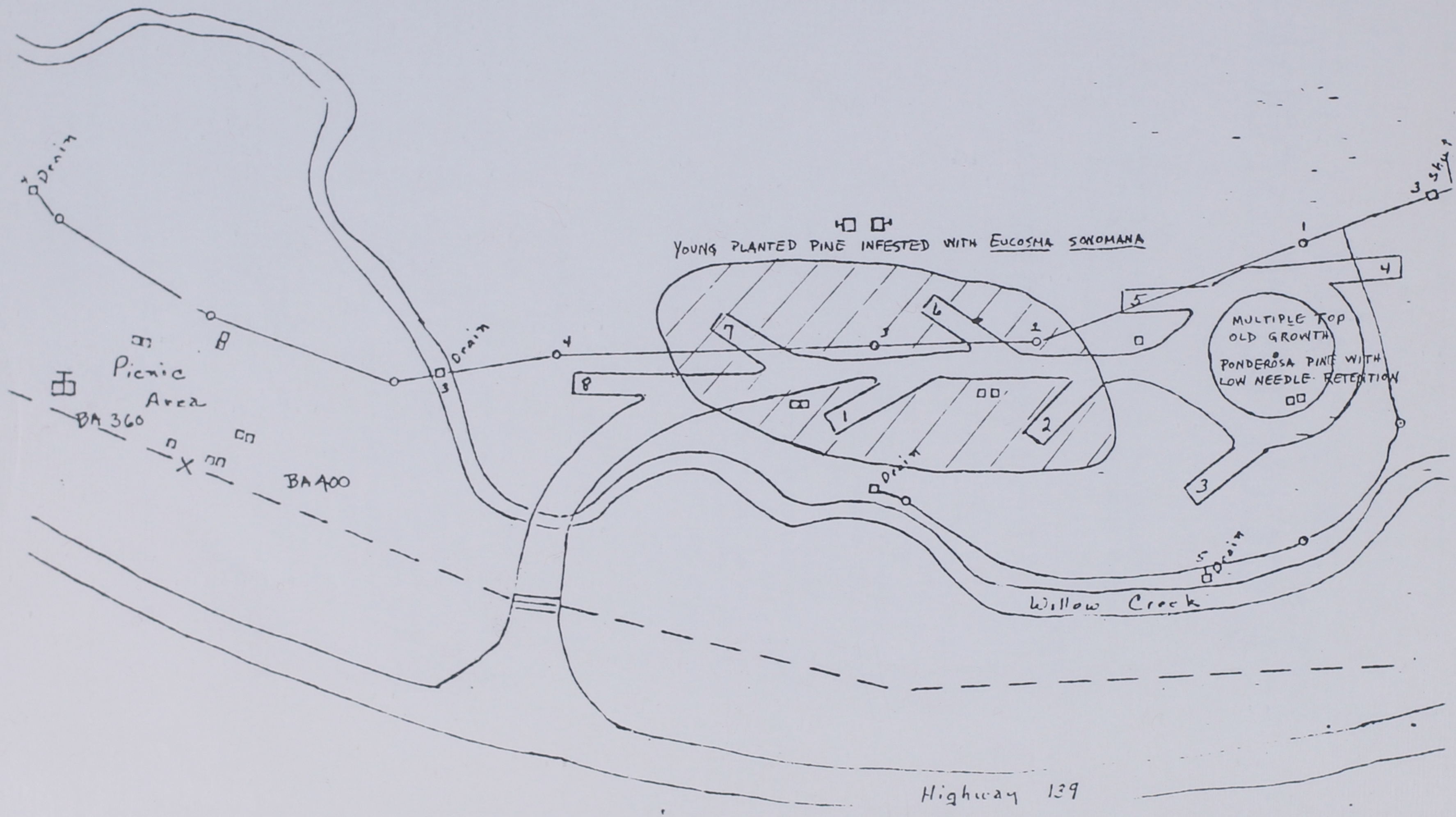
BA 180
• JEFFREY PINE WITH
LARGE FORK
• INCENSE-CEDAR
WITH FIRE SCAR
TO 6 FT. HEIGHT
DEAD JEFFREY PINE
ARMILLARIELLA MELLEA
Upper Rush Creek Campground
• JEFFREY PINE WITH
MECHANICAL INJURY
Drain
SEVERAL OVERSTORY
WHITE FIR AND
JEFFREY PINE
WITH DOGLEGS
BA 500
BA 320
Drain
20
INCENSE-CEDAR
WITH BROKEN TOP
DEAD JEFFREY PINE
ARMILLARIELLA MELLEA
SEVERAL JEFFREY PINE
WITH LARGE FORKS
BA 420
Legend Appendix B2
7 Camp Unit
Waterline
Faucets
Toilets
Garbage cans
N


OVERFLOW AREA
DEAD PONDEROSA PINE
AND INCENSE-CEDAR
DIEBACK OF
COTTONWOODS
DM3
COTTONWOODS WITH
SPLIT BOLES & WETWOOD
DM4
To water
tank o
spring
Rush Creek
DM4
DM5
DM2
DM5
POCKET
GOPHERS
DM3
DM5
Lower Rush Creek Campground
Legend Appendix B1
Camp Units 1-5
6-10
Waterline
Faucets
Toilets
Garbage cans
DM DWARF MISTLETOE LOCATIONS WITH
HAWKSWORTH SYSTEM RATINGS
N

ASH CREEK CAMPGROUND



Willow Creek Campground and Picnic Area